AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-21: cancelled

22.   (new): A multi-layer class identifying communication apparatus, which is provided with an input interface connected to input communication lines, a switch circuit and an output interface connected to output communication lines, and has a capability of allocating a plurality of IP-QOS (Internet.Protocol-Quality-of-Service) codes from information contained in a packet data received through one of said input communication lines, said apparatus comprising:

an allocating section provided in said input interface, which allocates said IP-QOS codes based on a combination of information contained in an IP packet header and a TCP header defined by an OSI reference model; and

a priority control section, which carries out a delay priority control and a discard priority control depending on a delay class and a discard class respectively, and each class corresponding to any of said IP-QOS codes allocated by said allocating section.

23.   (new): The multi-layer class identifying communication apparatus according to claim 22, said priority control section further comprises:

a first priority control section provided in said input interface, which controls a priority of request sending for said IP packet switching by said switch unit depending on an internal delay class corresponding to any of said IP-QOS codes, and controls discarding of IP packet depending

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on a discard control class corresponding to any of said IP-QOS codes when available memory

area of a reception side payload memory to be used for writing an input IP packet becoming

short; and

second priority control section provided in said output interface, which controls a priority

of IP packet sending from respective queue buffers corresponding to any of said IP-QOS codes,

and controls discarding of IP packet stored in said queue buffers depending on said IP-QOS code

and a length of queue data stored.

24.   (new): The multi-layer class identifying communication apparatus according to

claim 22, wherein said allocating section comprises:

a first search means, to which header information of said IP packet and said TCP packet

is input and a plurality of key information are retrieved for a second searching; and

a second search means to be used as second searching, for retrieving an address

information of external memory, in which said IP-QOS codes are registered, by using said key

information retrieved from said first search means.

25.   (new): The multi-layer class identifying communication apparatus according to

claim 22, further comprising:

an IP-QOS class scheduler provided in said output interface, which carries out a first

scheduling function for the highest priority IP-QOS code among said IP-QOS codes for

transmitting said IP packet stored in said queue buffer corresponding to said highest priority IP-

QOS code, a second scheduling function for the rest of priority IP-QOS codes for transmitting

said IP packet stored in respective queue buffers corresponding to the rest of priority IP-QOS

codes by control of Weighted Round Robin (WRR) scheduling method, and a fixed priority

scheduling method as a third scheduling function for the priority IP-QOS code applied for said

second scheduling function.

26.   (new): The multi-layer class identifying communication apparatus according to

claim 25, wherein said IP-QOS class scheduler carries out said fixed priority scheduling method

when no available IP packet cannot be found even after reset operation of said WRR scheduling

method has been completed.

27.   (new): A multi-layer class identifying communication method, in an apparatus

provided with an input interface connected to input communication lines, a switch circuit and an

output interface connected to output communication lines, and has a capability of allocating a

plurality of IP-QOS (Internet-Protocol-Quality-of-Service) codes from information contained in

a packet data received through one of said input communication lines, said method comprising:

allocating said IP-QOS codes based on a combination of information contained in an IP

packet header and a TCP header defined by an OSI reference model by an allocating section

provided in said input interface; and

carrying out a delay priority control and a discard priority control depending on a delay

class and a discard class respectively, and each class corresponding to any of said IP-QOS codes

allocated by said allocating section by a priority control section.

28.   (new): The multi-layer class identifying communication method according to

claim 27, said carrying out further comprises:

controlling a priority of request sending for said IP packet switching by said switch unit

depending on an internal delay class corresponding to any of said IP-QOS codes;

controlling discarding of IP packet depending on a discard control class corresponding to

any of said IP-QOS codes when available memory area of a reception side payload memory to be

used for writing an input IP packet becoming short; and

controlling a priority of IP packet sending from respective queue buffers corresponding to

any of said IP-QOS codes, and controls discarding of IP packet stored in said queue buffers

depending on said IP-QOS code and a length of queue data stored.

29.   (new): The multi-layer class identifying communication method according to

claim 27, wherein said allocating comprises:

receiving header information of said IP packet and said TCP packet is input;

retrieving a plurality of key information for a second searching; and

retrieving an address information of external memory, in which said IP-QOS codes are

registered, by using said retrieved key information.

30.   (new): The multi-layer class identifying communication method according to any

of claim 27, further comprising:

carrying out a first scheduling function for the highest priority IP-QOS code among said

IP-QOS codes for transmitting said IP packet stored in said queue buffer corresponding to said

highest priority IP-QOS code, a second scheduling function for the rest of priority IP-QOS codes

for transmitting said IP packet stored in respective queue buffers corresponding to the rest of

priority IP-QOS codes by control of Weighted Round Robin (WRR) scheduling method, and a

fixed priority scheduling method as a third scheduling function for the priority IP-QOS code

applied for said second scheduling function.

    31.   (new): The multi-layer class identifying communication method according to

claim 30, wherein said carrying out comprises:

    carrying out said fixed priority scheduling method when no available IP packet cannot be

found even after reset operation of said WRR scheduling method has been completed.